Module 12
Swine Inspection

Objectives

Upon completion of the swine inspection module, the trainee will be able to accomplish the following without the aid of references:

1. Select any true statements pertaining to the swine slaughter and sanitary dressing requirements for many of the following procedures:

a. Stunning	i. Hand scraping or shaving
b. Bleeding	j. Carcass washing
c. Scalding	k. Head dropping
d. Dehairing	l. Brisket opening
e. Gambrelling	m. Bung dropping
f. Rosin dipping	n. Eviscerating
9. Singeing	o. Splitting and trimming
h. Polishing	p. Neck cleaning

2. List two basic requirements that must be met when the plant is collecting edible swine blood.

3. Select from a list of conditions those that would be considered improper presentation and those that would be considered abnormal or pathological.

4. Select from a list and arrange in proper sequence the steps of swine head inspection.

5. Select any true statements about the lesions, general findings, or appearance of the following diseases or conditions:

   a. Hog cholera
   b. Anthrax
   c. Atrophic Rhinitis
   d. Icterus
   e. Diamond skin
   f. Arthritis
   g. Pericarditis
   h. Taenia solium cysticercus
   i. Tuberculosis
   j. Kidney worms
   k. Osteitis
   l. Hydronephrosis
   m. Embryonal nephroma
   n. Pleuritis
   o. Melanoma
   p. Cystic kidneys

6. Select the proper disposition of swine heads affected with tuberculosis or various types of abscesses.

7. Select statements that would describe the action to be taken by the inspector when carcasses and/or heads are improperly presented for inspection.

8. Given a drawing of a hog carcass, label correctly the five tagging positions that are used to retain an abnormal carcass.

9. Select true statements pertaining to the requirements for removing the following contaminants from carcasses or organs:

   a. Stomach or intestinal contents
   b. Milk
   c. Exudate & Pus
   d. Bile

10. Select from a group of statements any that give a valid reason for requiring inspection of organs even when they are excessively contaminated and cannot be cleaned thoroughly prior to inspection.

11. Select any true statements from a list of statements about requirements for swine viscera table cleaning.

12. Select from a list and arrange in proper sequence the steps of swine viscera inspection.

13. Give the requirement for kidneys presented for inspection, whether they are presented with the viscera or with the carcass.

14. Select from a group of statements the one that correctly defines what we mean by the term "spotting of livers."

15. Describe in your own words the special inspection procedure that boar hogs must undergo.

16. Select any true statements from a group of statements pertaining to the proper procedures for the swine viscera inspector to take on carcasses that have been previously tagged at the head inspection point.

17. Give the requirement, other than a U.S. Suspect tag, for identifying U. S. Suspect hog carcasses on antemortem (if the are destined for a scalding tank-dehairing machine operation.)

18. Define the term "primary seats of infection" as applied to tuberculosis in swine.

19. Select any true statements from a group of statements about proper actions for the inspector to take when he or she suspects tuberculosis in various primary seats.

20. Select from a list and arrange in proper sequence the steps of swine carcass inspection.

21. List the minimum number of brand marks that must be applied to each split or unsplit inspected and passed carcass before it goes to the cooler. Also, give the brand number and the diameter of such brand.

Module 12
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Head inspection is the first inspection procedure in postmortem inspection of swine. However, there are several slaughter and dressing procedures performed before the head is presented for inspection. The inspectors on the slaughter floor are responsible for monitoring these dressing procedures. Each inspector should be assigned a designated area of the slaughter operation to monitor for establishment compliance with sanitary dressing procedures. Inspectors also should ask their supervisor what their designated area encompasses.

There are three basic methods by which swine are dressed. They are:

1. Skinning

2. Hide pulling

3. Scalding vat-dehairing machine.

The scalding vat-dehairing machine is probably the most common method used. There are also various methods of presenting hogs for inspection.

There are variations in the way heads are presented for inspection. In some plants the head is removed and placed on a spike or loop and it comes with the viscera for that carcass. One inspector may then be totally responsible for not only viscera, but also head and carcass inspection. In larger plants, several inspectors at one inspection station may be performing various combinations of head, viscera, and carcass inspection.

For purposes of our discussion, we will, for the most part, be talking about an operation where the head is presented for inspection attached to the carcass and a scalding vat-dehairing machine is used. Keep in mind that, in your particular plant, some of the procedures that we discuss may be accomplished in a slightly different sequence, or may be omitted, due to variations.

Once antemortem inspection has been completed, the swine are driven to the stunning area and the stunning chute. One of the approved humane methods of stunning is utilized to render the animal unconscious. Depending on the speed and size of the operation, one or several animals will be stunned at the same time. The restraining device or stunning chute and table must be thoroughly cleaned before the start of each day's operation. The table onto which the stunned hogs are discharged must be kept clean and dry as possible.

The next step in the swine slaughter sequence is bleeding. Sticking must be done properly to ensure complete bleedout and to prevent shoulder wounds, which can become heavily contaminated during scalding, dehairing, and polishing. Since all stick wounds must be trimmed as contaminated tissue, the larger the stick wound, the more trimming that will be necessary. Hog blood may be saved for edible (human food) purposes if it is collected in a sanitary manner and positive identification is maintained until postmortem inspection has been completed. Either a lot or carcass identification of the carcasses is suitable.

A sanitizer must be present, because the sticker is required to sanitize the sticking knife after each suspect and each obviously diseased hog and when the knife is accidentally contaminated (MPI Manual 8.30(b)(2)).

Hog carcasses are usually shackled after they are stuck. In a small operation, they may be stuck while hanging from the shackle.

Death is to occur by thorough bleeding of the animal. While there is no time requirement, animals usually remain on the bleeding rail-no less than 5 minutes to assure complete bleeding and death. It is desirable to have them on the rail no longer than 30 minutes, to avoid the possible onset of decomposition and rigidity of the carcass, which may result in its mutilation when it goes through the dehairer and polisher.

After the stunning, sticking, and bleeding operations have been completed, the next procedure in the sequence is scalding. The purpose of scalding is to loosen hair from the carcass and thereby facilitate further sanitary dressing procedures such as dehairing and dirt removal.

There are several factors that influence satisfactory scalding, dehairing, and cleaning. Some of these factors are as follows:

1. Water circulation and the temperature of the scald vat water.

2. The number of carcasses and the time that carcasses remain in the scalding vat.

3. The condition and operation of the dehairing machine.

These factors may vary in different plants and with the type of hog. However, when given adequate attention, there should be no difficulty in obtaining satisfactorily cleaned carcasses.

Several things should be kept in mind about successful scald vat operations. A carcass should not enter the scalding vat prior to death. A hog that is scalded alive dies from asphyxia and will frequently have a scarlet red appearance and

have organs that are engorged with blood. The inspector should designate such hogs as U.S. retained for the FSIS veterinarian.

The points to keep in mind concerning sanitation of the scalding vat are as follows:

1. It must be drained and cleaned daily.

2. Fresh, clean, potable water must be used at the start of each day's operation.

3. If chemical additives are used in the scald water, they must be officially approved for that purpose.

The temperature of the scald water should be adequate to insure clean carcasses by loosening hair sufficiently. If the hog stays too long in the vat or at too high a temperature, overscald may result. This is the cooking of the carcass with breaking of the skin and resulting scald water contamination.

If the water is too cold or if the carcass is left for too short a period of time in the vat, the hair and scurf (which is a combination of skin, dirt, and other filth) will not loosen. This results in improper dehairing and the scurf being left on the carcass.

After the scalding operation, the dehairing machine is next in sequence. The dehairing machine must be maintained in good working condition to efficiently remove hair and to prevent mutilation by broken parts cutting into the carcass. The water temperature and the number of carcasses going through the machine must be regulated since these factors will greatly influence the dehairing effectiveness.

There is also a requirement concerning the water that is used in the dehairing machine. Some slaughtering operations use a single unit dehairing machine and others run the hogs through multiple dehairing machine units. According to the MPI Manual in Part 10.6 (c)(1), single or multiple unit machines may utilize recirculated water in the first two-thirds of the unit but clean water must be used in the last one-third of the unit or at least for the last six feet.

The next packinghouse procedure in the preparation of swine for head inspection is gambrelling--the hoisting of hogs to the vertical position by the tendons of the hind legs. After dehairing, the carcass is dumped onto the gambrelling table and aligned. The hind feet are to be clean of hair and scurf before the tendon is opened. The gambrel stick must be clean prior to usage on a carcass. After the stick is inserted under the tendons, the stick is then hooked into a trolley and hook that is used to convey the carcass along the dressing chain.

A rosin dip may also be used for dehairing. According to MPI Manual Part

10.6(c)(2), if carcasses are dipped in rosin, the nostrils and mouth should be closed with rubber bands, or other suitable means, prior to dipping.

Singeing is the next sanitary dressing procedure. The singer is used for burning off the fine hair present on hogs. The singer is operated by gas and should be equipped with an automatic cut-off and starter switch to prevent burning of carcasses when the chain stops. Singeing is an important dressing procedure in the preparation of the carcass for the dropping of the head. The carcass must be properly cleaned before the head is dropped or before any other opening cut is made in the carcass.

Some plants have a polisher in the sanitary dressing sequence of procedures, although it is not absolutely required. The purpose of the polisher is to knock off singed hairs and other contaminants. It usually consists of a diagonal shaft with variable sets of hard rubber beaters and should be used in conjunction with potable water sprays.

Hand scraping or shaving is done either after singeing or polishing. The purpose of hand shaving is to remove all the hair before the final wash. On small kills, one or two workers may do it all. On large kills, workers may shave designated areas and be designated as ham shavers, belly shavers, or shoulder shavers.

Shower sprinklers may be used between positions to loosen and wash off the shaved hair. After all of the major surface areas are shaved, the jowls, head, and lips are done.

The establishment must properly clean hog carcasses before any opening is made for evisceration or for dropping of the head. Once an opening cut is made in the carcass, hair, scurf, etc., shall be removed by trimming. Eyelids may be trimmed prior to washing, but must be removed prior to the dropping of the head.

The last procedure prior to head dropping is carcass washing, the purpose of which is to remove loose dirt, hair, scurf and rosin. The water spray used should be a strong fine spray to accomplish the final wash.

Additionally, prior to head dropping, the front feet should be trimmed free of interdigital tissue and the toenails removed.

Finally, the head dropping procedures take place so that head inspection may be done. There are several points to keep in mind about head dropping, one of which is that the head should be dropped in a manner that leaves the mandibular lymph nodes attached to the head and available for inspection. It is improper presentation if the nodes are not left attached to the head for inspection. Also, the header's knife must be sanitized after each head is dropped, due to the frequency

of abscesses and tuberculosis in the cervical area of swine. You must also remember that no shaving is to be done after the head is dropped.

You might be assigned to a plant that presents heads for inspection in the form of market heads. A market head is a swine head that is presented with the jowls left attached after dressing. According to the MPI Manual in 10.6(e)(4) there is a requirement that the nasal and oral cavities of market heads sold intact shall be thoroughly flushed.

The head inspection procedures for swine are as follows:

1. Observe head and cut surfaces.

2. Incise and observe mandibular lymph nodes.

3. Observe/retain carcass, when required.

Fifty footcandles of light must be provided for inspection at the level of the mandibular lymph nodes of the lowest hanging heads. As head inspectors observe the carcasses, they should closely examine them for proper cleaning. Now that we have seen what the swine head inspection entails, let's talk about some common examples of improper presentation of swine for inspection:

1) Head missing--the head can't be inspected if it's not there.

2) Mandibular lymph nodes left in the neck instead of on the head.

3) Hog rings--these should have been removed as part of the cleaning operation prior to head inspection.

4) Ear tags and rosin contamination.

Based on the severity and the frequency of the improper presentation, certain actions should be taken by inspection.

1. First, try directing the properly designated plant personnel to immediately remove the condition of improper presentation and delay inspection procedures until the condition is removed.

2. If action in #1 is not suitable, then direct the properly designated plant employee to stop the chain and remove the condition if it cannot be removed prior to the carcass leaving the inspection area. In some plants, the inspector may be able to stop the chain, but it is better to let the establishment do this if possible.

3. If conditions exist to the extent that the chain has to be repeatedly stopped, then delay inspection and ask plant management (such as the proper foreman) to correct the problem.

4. The IIC may require the plant to reduce the line speed until the conditions are favorable.

In addition to improper presentations, the inspector needs to be on the constant lookout for abnormal conditions. When the food inspector finds an abnormality while performing head inspection, his or her action would be as follows:

1. If the localized condition does not affect the disposition of the head or carcass, have the plant trim the affected tissues.

2. If the abnormality affects the disposition of the head or carcass, complete the head inspection and use the two-section black retain tag for retaining the carcass. Place the tag on the side of the carcass approaching the viscera inspector.

3. Stop the chain and call the supervisor if anthrax-like lesions are found.

The official tagging procedure is described in the MPI Manual in 11.5(a). It states that "tags shall be attached to the side of the carcass approaching the viscera inspector and as follows":

1. Cervical tuberculosis--place the two-section tag on the abdomen, lateral to the xiphoid process.

2. Slight cervical abscess--place the tag on the foreshank.

3. Well-marked or extensive abscess--place the tag on the axillary area.

4. A carcass not to be opened--place tag on the midline, above the xiphoid cartilage.

5. Other conditions--place the tag on the abdomen, lateral to the midline.

Tuberculosis may be detected during head inspection in varying degrees. The inspector must condemn the head if any amount of tuberculosis is found in the head during head inspection. The head is usually stamped at the viscera inspection station and the nodes in the jowls removed and condemned as required. The carcass would be tagged on the abdomen, lateral to the xiphoid process.

Abscesses are another common finding during the inspection of the head. When slight, small, well-encapsulated abscesses are found on head inspection, the

carcass should be tagged on the foreshank. When well-marked or extensive abscesses are seen, the carcass should be tagged in the axillary area by the head inspector. Ultimately, the disposition of the extensive or well-marked abscessed head will be condemnation (probably at the viscera inspection station) and the affected areas in the jowl will be removed and condemned.

When an animal identified as a U.S. Suspect on antemortem inspection reaches the head inspection station, the inspector should place a two-section retain tag on the leading side of the suspect's abdomen, lateral to the midline. This indicates the carcass and parts are to be retained for veterinarian to examine. In addition to a metal suspect tag, a tattoo is needed as a positive means of carcass identification since a tag could easily be lost in the scalding vat or dehairing machine.

At the head inspection station you may see atrophic rhinitis--(MPI Manual 11.5(l)(8))--swine with atrophic rhinitis may have a characteristic nose disfiguration, absence of nasal turbinate bones, and small amounts of pus or exudate in the nasal sinuses. The turbinate soft tissues may be present, but they are folded against the nasal cavity wall since the supporting bony structure has disappeared. Since this condition is usually localized, head tissues can be removed without contamination and saved for food.

It was previously mentioned that if anthrax-like lesions are found, you must stop the chain and notify the supervisor immediately. With anthrax, the animal may have a swollen neck, dark blood that does not clot, and salmon-pink lymph nodes.

When anthrax is detected on postmortem inspection, the VMO shall stop all slaughter operations, inspect and condemn dropped heads from the detection point to the head dropper and require:

1. Stick wound trimming from the detection point to the sticker.

2. Preliminary cleanup:

(a) Cleanse and disinfect knives, aprons, boots, and equipment contaminated with anthrax-infected material

(b) Drain the scalding vat or heat the water to the boiling point

(c) Cleanse floors, benches, and equipment contaminated by the affected carcass with 180 degree Fahrenheit water

(d) Cleanse and disinfect the arms and hands of the employees who contacted the infected material, as outlined in regulation 310.9.

3. Perform general cleanup and disinfection as required by he regulations.

We have covered the sanitary dressing procedures that must take place in order to get a swine carcass ready for head inspection. We have discussed head inspection and some of the examples of improper presentation and some of the types of pathological conditions that may be encountered. Let us now cover what happens to the carcass before viscera inspection.

The next dressing procedure after head inspection is brisket opening. While opening the brisket, the plant employee should use special precautions to avoid cutting the viscera. The brisket knife or saw is to be sanitized after use on each animal, since the thoracic cavity is entered and there is no way of knowing if abscesses or other abnormal conditions are present to contaminate the knife or saw. Eventually, the carcass will be prepared in such a way that the viscera and carcass can be inspected.

Contaminants on the midline must be trimmed before opening the abdominal cavity. When opening the midline, establishment employees must exercise care to prevent cutting the urinary bladder, intestines, stomach, or gall bladder. A special knife is usually used to prevent cutting the viscera. The cut is made with the knife point out, using the hand to push back the viscera.

The penis (pizzle), the uterus, the urinary bladder, and lactating mammary glands are removed. Using clean hands and a clean knife, the bung is dropped. When it is necessary to prevent contamination of the carcass or viscera, the rectum must be tied before evisceration.

After these operations, the actual evisceration occurs. The eviscerator must take precautions not to drop the viscera or drag it across the platform or floor. Some carcasses may come to the eviscerator with the two-section retain tag placed in any one of five locations that we discussed previously. Except when the tag is on the midline (not to be opened and to be retained for veterinary disposition), the eviscerator removes one of the two tags and places it in the pan with the viscera for that particular carcass.

Organs and carcasses contaminated by stomach or intestinal contents, urine, bile, etc, should be thoroughly cleaned before being presented for inspection. Such contamination shall be removed in a manner satisfactory to the inspector. Removal of contamination by washing may be acceptable if there is no splashing or spreading of the contamination. Generally, when the surfaces are smooth and unbroken, like the surface of a liver, washing may be satisfactory. When the surfaces are neither smooth nor unbroken or when the contamination is extensive or when washing only serves to spread the contamination, trimming would probably be the best policy. If the contamination is so excessive that all or part of a set of viscera must be condemned, the viscera still must be cleaned sufficiently

so that inspection can be performed, because lesions may be observed that could affect the disposition of the head, viscera, or carcass.

Carcass tissues or organs contaminated with milk, pus, exudate, or pathologic tissue must be trimmed under the inspector's direct supervision. Scraping, washing, or wiping is unacceptable (MPI Manual 11.5(d)(2)). Washing skinned carcasses before inspection to remove contaminants resulting from improper dressing is not permitted. Such contaminants must be removed by trimming (MPI Manual 10.6 (g)(2)).

Contaminated equipment must be washed with water and then sanitized. The moving top viscera table must be cleaned and sanitized continuously. It should be given a cold water rinse, then 180 degree Fahrenheit water sanitizing, and a final cold water rinse. A temperature gauge readily visible to the inspector must be present.

Since we are now at the point of having the viscera inspected, let's cover the inspection procedures. You may wish to review the swine postmortem inspection videotape. The viscera inspection includes the following:

1. Observe the eviscerated carcass, viscera, and parietal (top) surface of spleen.

2. Observe and palpate mesenteric lymph nodes.

3. Palpate portal lymph nodes.

4. Observe dorsal surface of lungs.

5. Palpate bronchial lymph nodes.

6. Observe mediastinal lymph nodes.

7. Turn lungs over and observe ventral surfaces.

8. Observe heart.

9. Observe dorsal surface of liver.

10. Turn the liver over and observe ventral surface.

11. Condemn viscera or parts when required.

12. Retain carcass, viscera, and parts when required.

When kidneys are removed from the carcass and presented with the viscera for inspection, they must have the capsule removed by an establishment employee, then be observed and palpated during viscera inspection.

"Spotting of livers", which is the removal of parasitic scars, is permitted if the livers are deemed not to be excessively infested. Abscesses are not to be confused with parasitic scars.

As in head inspection, there are various forms of improper presentation that occur at the viscera inspection station. Contamination with feces or ingesta is one of the most common defects. Hair, toenails, pus, bile, and parts of viscera missing are other common examples of improper presentation. Since the actions the head inspector takes with improper presentations are similar to actions taken by the viscera inspector, we won't discuss them again.

We have already discussed, when describing head inspection, the procedures for retaining a carcass. The two-section identically numbered U.S. retain tag is divided. One section is placed lateral to the midline on the abdomen to indicate "other condition" (other than cervical tuberculosis and abscess) and the other section is placed on the viscera. A plant employee removes both carcass and viscera to the veterinary disposition area. Let us now look at some of the abnormal conditions that could be encountered during viscera inspection.

Arthritis--joints with localized arthritis and corresponding lymph nodes shall be removed and condemned during dressing operations and before inspection is completed. The plant may be eligible for an alternative method of removing and condemning hind feet with arthritic hock joints on the porkcut if all restrictions are meet [Manual 11.5(1)(7)].

Pleuritis--localized, chronic pleuritis with adhesions may be "peeled out" with the remainder of the carcass passed for food. If pleuritis is acute, extensive, or other associated pathology is present, the carcass and its parts should be retained for veterinary examination.

Pneumonia--lungs that have been contaminated with scald vat water resemble lungs with pneumonia

Nephritis--one or both kidneys may be affected. Localized conditions require the affected kidney(s) to be removed and condemned. If there is doubt as to whether the condition is localized to the kidney or if other pathology exists, retain the carcass for the veterinarian.

Embryonal nephroma--these are tumors of the kidney. Generally, they are benign and occur more commonly in young animals. These carcasses and parts should be retained for veterinary disposition.

Hydronephrosis--one of both kidneys literally become a "bag of water". Normal kidney tissue is replaced by fluid. There is generally no effect upon the carcass. Affected kidneys are removed and condemned.

Sexual odor--each boar hog that is slaughtered should be screened for the pungent sexual odor that is characteristic in some boar hogs. If sexual odor is detected by the viscera inspector, the carcass and viscera should be retained for veterinary disposition.

Pericarditis--if acute, extensive, or other pathology is detected, retain for veterinary disposition. If pericarditis is localized and chronic (adhesions of the pericardial sac to the wall of the heart), the heart and pericardium is condemned and the carcass may be passed for food.

Cysticercosis (pork measles)--a parasitic condition caused by a tapeworm cyst (Taenia solium cysticercus). Similar to beef measles, it can affect any muscle tissue in the carcass. In pork, the heart seems to be the most common site. The carcass and parts must be retained for the veterinarian to examine.

Icterus--the carcass has a lemon-yellow appearance. Icterus particularly affects connective tissues (tendons, ligaments, sclera of the eye, etc.). Carcasses affected with any degree of icterus are retained for veterinary disposition.

Hog cholera--identified by such findings as hemorrhagic lymph nodes and red spots on belly and legs, and possibly a "turkey egg" kidney. If you detect abnormal hemorrhages or suspect hog cholera for any reason, retain the carcass and notify the veterinarian immediately.

Septicemia--a generalized inflammatory condition caused by pathogenic bacteria and their associated toxins in the blood. Most, or all, of the body lymph nodes may be enlarged, hemorrhagic, and edematous. Kidneys may have petechiae (small pinpoint hemorrhages). Other pathology may be present. Retain the carcass for veterinary disposition.

Ascarids--the larva of these roundworms frequently migrate through the liver and cause scarring on the livers surface. "Slight" scarring may be trimmed (spotting the liver). More than slight evidence of ascarids requires the liver to be condemned.

Abscesses--MPI Manual 11.5(d)(l)--if the carcass has been tagged by the head inspector for a slight cervical abscess and the viscera inspector finds tuberculosis (TB) in the viscera,, the carcass and viscera must be retained for veterinary disposition. If no lesions are found in the viscera, the viscera inspector will permit the head to be used for food after complete removal and condemnation of the

mandibular and adjacent lymph nodes in the jowls. However, if the plant does not choose to trim as described, the head and jowls will be condemned.

If the carcass has been tagged by the head inspector for an extensive cervical abscess or for cervical TB lesions and the viscera inspector does not find TB in the viscera, the viscera inspector condemns the head and the lymph nodes in the jowls and passes the carcass and viscera.

Tuberculosis (TB)--the primary seats of TB are defined as the mandibular, the mesenteric, and the mediastinal lymph nodes in swine. These sites are regarded as the primary seats for disposition purposes only and do not necessarily have any correlation with the frequency at which tuberculosis is found in any location. Probably the most common sites at which tuberculosis lesions would be found would be the mandibular and mesenteric nodes and the liver. The food inspector is authorized to make a limited disposition for tuberculosis on a swine carcass with TB lesions in only one primary seat. For example, if tuberculosis is found in the mesenteric lymph nodes only, it is not necessary to tag the carcass and retain it. However, if there is TB in more than one primary seat or in any site other than a primary seat, then that carcass and viscera must be retained for veterinary disposition.

Some sort of record of carcasses with cervical abscesses or contamination or of carcasses that have been retained for tuberculosis by the head or viscera inspector should be kept by the food inspector. The record may be kept by marking on paper or by using a recording device.

In some plants the carcass splitting operation takes place after viscera inspection. The splitting saw or cleaver must be sanitized after each retained carcass or, if the carcass is split before viscera inspection, it must be sanitized after each carcass. (MPI Manual 8.30(b)(2)) After the splitting operation, trimming procedures such as removal of abscesses from the ham facings and removal of castration scars, pizzles, and related tissue should take place.

After the splitting and trimming of the carcass, the neck should be cleaned. Pieces of trachea, blood vessels, and blood clots must be trimmed and washed from the neck.

External stick wounds contaminated by debris from the skin, scald water, and clotted blood must be trimmed. Other tissues contaminated by scald water must also be trimmed. Internal stick wounds should be opened for removal of blood clots (MPI Manual 11.5(l)(5)).

Kidney popping or removal of the capsule from the kidney for adequate inspection is another necessary requirement, as is the removal of the thyroid gland.

All remnants of spermatic cords, abscesses, and bruises that are present in the ham facings must be removed. If tapeworm cysts should be found, the carcass should be retained for veterinary disposition.

Inspectors must examine carcasses, organs, and parts for diseases, abnormalities, and contamination. There are four carcass inspection steps:

1. Look in the mirror and observe the back of the carcass. In plants where the mirror is not required, turn and observe the back of the carcass.

2. Observe the front parts and the inside of the carcass.

3. Grasp, turn, and observe the kidneys (both sides).

4. Direct the trim, remove retain tags, or retain the carcass when required.

If the abnormal conditions seen on carcass inspection do not require veterinary disposition, the inspector can have the plant employee properly trim the carcass. If the carcass requires retention, you know how to properly retain a carcass from our previous discussion. Since we have previously described many examples of improper presentation, let's just review some of the examples of abnormal conditions that may be seen during carcass inspection.

Arthritis--arthritis in a joint may be indicated by the appearance of the lymph nodes associated with that joint. For example, enlarged, darkened internal iliac lymph nodes are a common finding with arthritis in the hindquarters.

Abscesses--abscesses may be found anywhere in the carcass or its parts.

Diamond skin disease--these carcasses should be retained for veterinary disposition. While most are trimmed and passed for food, the veterinarian may find systemic involvement and condemn the carcass.

Nephritis--nephritis may be detected during viscera inspection or carcass inspection depending upon how the kidneys are presented for inspection.

Cysticercosis--as in beef cysticercosis (measles), cysts can be found in any muscle tissue. Retain for veterinary disposition.

Melanoma--these are tumors that contain black pigment (melanin). Retain these for veterinary disposition.

Neoplasm (malignant lymphoma)--these tumors are commonly found in and around lymph nodes, but may be detected anywhere. They are always considered

malignant and must be retained for the veterinarian. Anytime you detect an abnormal mass (tumor), you should retain the carcass for veterinary disposition.

Cystic kidney--clear, fluid filled cysts of varying sizes. Condemn the kidneys (unless slight) and pass the carcass for food.

Embryonal nephroma--retain for veterinary disposition.

Kidney worms--this condition can also be seen in the soft tissue of the carcass and abdominal viscera. Generally this is a localized condition. Condemn the kidney and affected tissues.

Adhesions--these fibrous bands form as a chronic response to inflammation and are an attempt by the body to heal. They cause parts/organs to be joined abnormally. Condemn affected parts and pass the carcass if no other pathology is noted.

Abscess in the backbone--always check carefully along the backbone of the split carcass. It is possible to see abscesses, neoplasms (tumors), or evidence of trauma (fractures and bruising).

Bruises--bruised tissue should be trimmed and condemned. If evidence of infection exists, retain the carcass for veterinary disposition.

Quite often, after the hog is dressed completely and all inspection procedures have been accomplished, leaf fat removal will take place. Leaf fat is the heavy layer of fat lining the walls of the abdominal cavity and is used in the rendering process.

Sometimes the smaller pieces of the leaf fat (scrap fat) are removed with a hand scraper or an air knife.

Would you believe it? The carcass is now ready to be washed, branded, and sent to the cooler. Necks may be washed (primarily to remove blood clots) after leaf and scrap fat removal. Skimmings from such washing shall not be used for edible purposes. If the carcass was scalded, bone dust may be washed from the carcass. If the carcass was skinned instead of scalded, the carcass must be washed to assure removal of possible loose hair.

The marks of inspection are applied just prior to the carcass entering the cooler. Each carcass must contain at least- one mark of inspection on each half before entering the cooler if the carcass is split completely. If the sides of the carcass are held together by natural (skin) attachments, one mark of inspection would be sufficient. The brand utilized is the no. 1 (1 3/4" diameter).

Module 12
Swine Inspection

Supplement

1. Matching - Part 1- Place the letter of the appropriate response(s) in the right column in the space provided in front of statements in the left column. There may be more than one correct answer.

1. _____Animals should not enter scalding tank prior to

2. _____Factors influencing effective scalding are

3. _____Optimum temperature of scald water is

4. _____Additives used in scald water must

5. _____Single unit dehairing machine requires

6. _____Multiple unit dehairing machine requires

7. _____Hind feet are to be clean of hair and scurf before

8. _____Animals dipped in rosin require

9. _____The singer is equipped with automatic cut-off to prevent

10. _____All hair, scurf, dirt, rosin, hoofs, claws, eyelids are removed prior to

11. _____Equipment used to drop or remove head must

a. usually considered to be 138°F to 140°F

b. nostrils, mouth closed with rubber bands prior to dipping

c. overall wash and any opening made in carcass

d. stunning, sticking, death

e. be approved

f. water circulation, temperature, number of carcasses, time

g. clean water in last 1/3 or in last six feet

h. gambrelling

i. burning of hogs when chain is stopped

j. be sanitized after each use

Matching-Part 2

1. _____Swine blood is
2. _____Appearance of hog scalded alive are
3. _____Shaving is permitted only
4. _____In case of repeated improper presentation
5. _____If Anthrax type lesions are found
6. _____When draining cervical abscess is encountered

a. before any final wash and any opening made in the carcass
b. stop the chain and call the veterinarian
c. edible
d. delay inspection until properly presented
e. red-scarlet
f. complete inspection procedures; condemn and have head removed

Matching- Part 3

1. _____The brisket knife or saw is to be
2. _____The rectum must be tied before
3. _____Carcasses contaminated by stomach, intestinal content or bile must
4. _____Organs must be clean before
5. _____Organs excessively contaminated
6. _____Lactating mammary glands shall be
7. _____Spermatic cords, pizzles, and preputial diverticuli
8. _____Pus contamination shall be
9. _____Ham facings are examined for presence of
10. _____Remnants of liver and lungs attached to carcass
11. _____Equipment used for splitting carcass prior to inspection requires

a. shall be condemned
b. shall be removed from carcasses
c. spermatic cord, abscesses, bruise, scars
d. inspection
e. trimmed
f. evisceration, if necessary, to prevent contamination
g. removed without opening the milk ducts
h. be cleaned in a manner acceptable to the inspector
i. sanitized after each use

Matching - Part IV

1. _____Kidneys shall be
2. _____Stick wounds and other tissue contaminated by scald water
3. _____Burns, lacerations, bruises, and overscald
4. _____Dry melanin deposits on skin need not be
5. _____Carcasses with tumorous or smeary melanin deposits should
6. _____Neck washing is performed primarily to
7. _____Swine lungs are
8. _____The moving viscera containers are cleaned by
9. _____Before entering cooler each 1/2 carcass
10. _____#1 brand is used for branding

a. remove bloods clots
b. must have one brand on each half
c. exposed for inspection
d. inedible
e. are to be trimmed
f. cattle and swine carcasses
g. first cold water, then hot water (min. 180°F), then cold water rinse
h. trimmed
i. be retained

2. The two basic requirements that must be met when the plant is collecting edible swine blood are as follows:

   a.

   b.

3. Arrange in proper sequence the following swine head inspection procedures. Place the proper number by the proper procedure to make the sequence correct.

   _____a. Observe/retain carcass when required.

   _____b. Incise the mandibular lymph nodes.

   _____c. Observe head and cut surfaces.

4. Arrange in proper sequence the following swine viscera inspection procedures. Place the proper number by the proper procedure to make the sequence correct. The drawing on *attachment 1* may be of assistance.

   _____ a. Observe the heart.

   _____ b. Observe the eviscerated carcass, viscera, top surface of spleen.

   _____ c. Observe and palpate the mesenteric lymph nodes.

   _____ d. Turn the lungs over and observe the ventral (flat) surfaces.

   _____ e. Palpate portal lymph nodes.

   _____ f. Observe the dorsal (curved) surface of the liver.

   _____ g. Turn the liver over and observe ventral (flat) surface.

   _____ h. Observe mediastinal lymph nodes

   _____ i. Observe dorsal (curved) surfaces of lungs.

   _____ j. Palpate bronchial lymph nodes.

   _____ k. Condemn viscera or parts when required.

   _____ l. Retain carcass, viscera, and parts when required.

5. Arrange in proper sequence the following swine carcass inspection procedures. Place the proper order by the proper procedure to make the sequence correct.

   _____ a. Grasp, turn, and observe kidneys (both sides).

   _____ b. Observe front parts and inside of carcass.

   _____ c. Observe the back of the carcass.

   _____ d. Direct trim, remove retain tags, or retain carcass when required.

6. Select from the following those items that would be considered examples of improper presentation inspection or examples of carcass abnormalities. Use code "IP" for selecting improper presentation examples and "A" for abnormalities.

   _____ a. Head missing

   _____ b. Toenails or hoofs present

   _____ c. Arthritis

   _____ d. Icterus

   _____ e. Mandibular nodes in the neck

   _____ f. Interdigital skin present

7. Select any true statements about the lesions, general findings, or appearance of the following diseases or conditions: (Mark your choices with an "X".)

   _____ a. Atrophic rhinitis may cause swine to have a characteristic nose disfiguration or absence of nasal turbinate bones.

   _____ b. Anthrax may produce salmon-pink lymph nodes.

   _____ c. Hog cholera would be unlikely to produce a condition we refer to as "turkey egg kidney."

   _____ d. In diamond skin disease, lesions would never be seen on the carcass itself.

   _____ e. Melanomas are tumors of hogs that are usually black in color.

8. Select the proper ultimate disposition of swine heads affected with tuberculosis or various degrees of abscessation. Use the following codes to mark your dispositions:

   C = Condemn head and adjacent nodes in jowls

   T = Have affected areas trimmed and allow the head to be passed for human food.

   A = Allow head to be passed only for animal food.

   _____ a. Head with very slight tuberculosis lesions in one mandibular lymph node.

   _____ b. Head with extensive tuberculosis of the mandibular lymph nodes.

   _____ c. Head with slight abscess of the tissues.

   _____ d. Head with extensive, draining-type abscess.

9. If you were the assigned inspector on a hog kill slaughtering 75 hogs per hour and after about 1 hour of work a hog came down the line with two machine cuts not trimmed, what would be your best course of action for this improper presentation? This is the first instance of improper presentation today. (Mark you choice with an X.)

   _____ a. Stop the slaughtering chain, leave your position, seek out the foreman and have a little talk.

   _____ b. Direct the properly designated plant personnel to immediately remove the condition of improper presentation and delay inspection procedures until the condition is removed.

10. Using attachment #2 for your answers, label correctly the five tagging procedures that are used to retain a carcass when an abnormal condition is noted on swine inspection. Label the carcass as follows:

    (a) Place the figure 1 in the exact location for tagging a carcass detected with a slight cervical abscess.
    (b) Place the figure 2 in the exact location for tagging a carcass detected with a well-marked or extensive cervical abscess..
    (c) Place the figure 3 in the exact location for tagging a carcass detected with cervical tuberculosis.

(d) Place the figure 4 in the exact location for tagging a carcass that is detected with any condition requiring the attention of a veterinarian.
(e) Place the figure 5 in the exact location for tagging a carcass that is not to be opened.

11. Select any true statements about the requirements for removing various contaminants from carcasses or organs. (Mark your choice(s) with an X.)

_____ a. If a carcass should be contaminated with stomach or intestinal contents, the carcass must be thoroughly cleaned before being presented for inspection.

_____ b. It is not necessary for organs slightly contaminated to be cleaned before being presented for inspection.

_____ c. Although it is required that all pus contaminants must be trimmed under an inspector's direct supervision, it is permissible to wash away milk contamination.

_____ d. As a general rule, it would be preferable to trim most contaminants rather than to wash them away.

12. Select by marking with an X the most valid reason for requiring inspection of organs even when they are excessively contaminated and cannot be cleaned prior to inspection.

_____ a. Because regulations are regulations and you are paid to inspect all viscera and carcasses.

_____ b. Because lesions might be observed that could affect the disposition of the head, viscera, or carcass.

13. Which statement best describes the requirement for moving-top viscera table cleaning? (Mark your choice with an X.)

_____ a. The moving-top swine viscera table need only be cleaned on occasions when it is contaminated.

_____ b. The swine viscera table should be sanitized and continuously cleaned by a hot water rinse (180° F) followed by a cold water rinse.

_____ c. The swine viscera table should be sanitized and continuously cleaned by a cold water rinse, then 180° F water sanitizing, then a final cold water rinse.

14. Select the statement that correctly describes the establishment requirement for preparing kidneys for inspection (Mark your choice with an X.)

    _____ a. Kidneys must always be presented for inspection in the carcass and never be presented with the viscera for inspection.

    _____ b. Kidneys must always have the capsule removed by an establishment employee before being presented for inspection.

15. Select any true statements(s) about the "spotting of swine livers." (Mark your choice(s) with an X.)

    _____ a. "Spotting of swine livers" means that we allow the plant to trim slight abscesses and pass the liver for human food.

    _____ b. "Spotting of livers" means that we allow the plant to trim excessively infested parasitic-scarred livers and pass them for human food.

    _____ c. "Spotting of livers" means that we allow the plant to trim the parasitic scars from livers not excessively scarred and pass the livers for human food.

16. Describe in your own words the special inspection procedure that boars must undergo.

17. Select any true statement(s) about actions that the viscera inspector would take on carcasses that have been previously tagged or retained at the head inspection point. (Mark your choices(s) with an X.)

    _____ a. If a carcass came to the viscera inspection station with a tag on the foreshank and the viscera inspector found tuberculosis in the mesenteric nodes, that carcass should be retained for veterinary disposition.

    _____ b. If a carcass came to the viscera inspection station with a tag in the axillary space and no lesions were found in the viscera, the head should be condemned along with the adjacent nodes in the jowls, and the carcass should be passed for food.

    _____ c. If a carcass showed no lesions of tuberculosis in the head but revealed a tuberculosis lesion in the spleen only, that carcass should be passed for food.

18. What other method of identification (other than a U.S. Suspect tag) is required to be used to identify suspects that are destined for a scald vat-dehairing machine operation?

19. List the "primary seats of infection" as applied to tuberculosis in swine.

20. Select any true statement(s) about proper actions for the inspector to take when he or she discovers tuberculosis in various primary seats. (Mark your choice(s) with an X.)

    _____ a. If the head inspector discovers tuberculosis in the mandibular node, the carcass should be retained with a two-sectioned tag by placing them in the axillary space area.

    _____ b. If a carcass had tuberculosis of the mandibular node and also of the mesenteric nodes, that carcass should be retained for veterinary disposition.

    _____ c. If the viscera inspector finds tuberculosis in the mesenteric and mediastinal nodes, the carcass should be retained for veterinary disposition.

    _____ d. If the inspector finds tuberculosis only in the hepatic node and mesenteric node he or she should not retain the carcass for veterinary disposition.

21. (a) What is the minimum number of brand marks that must be applied to each inspected and passed carcass before it goes to the cooler under the following conditions:

    _____ The carcass is split into two halves

    _____ The carcass halves are left attached (i.e., the two halves are not separated.)

    (b) What brand number (i.e., 1,2,or 3) is used and what is its diameter?

22. Answer the following questions about lesions, general finding, or appearance of the following conditions:

A. Hog cholera
(1) appearance of lymph nodes

(2) appearance of carcass

(3) appearance of kidneys

B. Anthrax

(1) appearance of lymph nodes

(2) appearance of blood

(3) appearance of neck region

C. Atrophic rhinitis

(1) appearance

D. Icterus

(1) appearance of carcass

(2) appearance of fat

(3) appearance of eyeballs

E. Arthritis

(1) appearance of joint

(2) possible appearance of internal iliac lymph node if arthritis in hindquarters

F. Pneumonia

(1) Usual site of infection

G. Pericarditis

(1) Usual site of infection

(2) Appearance

H. Pork measles (Cysticercosis)

(1) Usual site of infection

(2) appearance

I. Kidney worms

(1) usual site affected

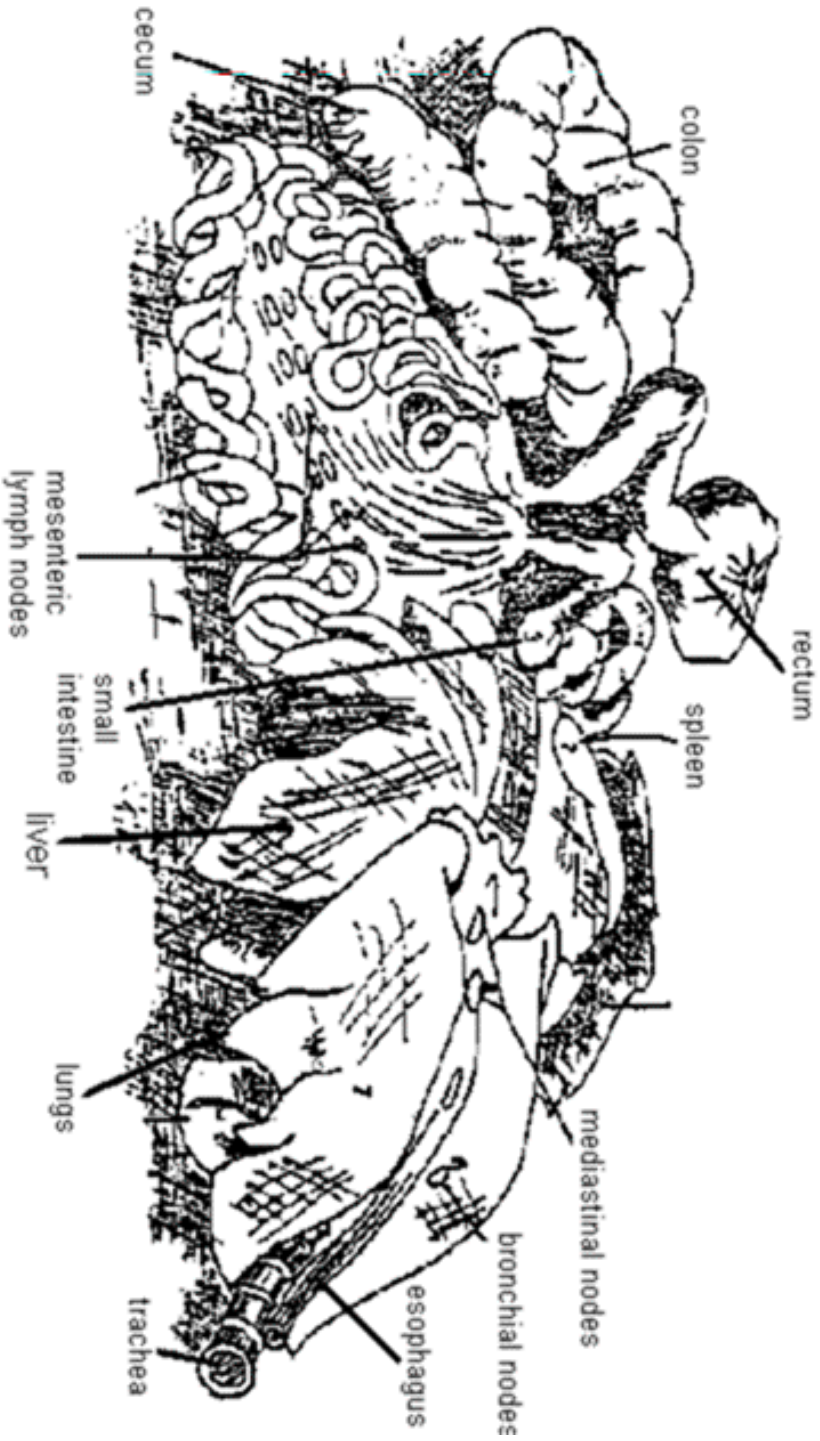
J. Animal scalded alive

(1) appearance

K. Cystic kidneys

(1) appearance

Attachment 1



Attachment 2